Interventions for Second-Order Change in Higher Education: Challenges and Barriers

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Abstract: From 2005 to 2008 the international research and development project iCamp carried out a series of targeted educational interventions into existing teaching and studying practices within a cluster of European universities. These interventions were meant to establish educational experiences that would correspond with key features of international, distributed and technologically mediated work settings. The main educational objective was the advancement of important dispositions (skills, knowledge, attitudes and orientations) for collaborating with others and for self-directing intentional learning projects in such settings. The large-scale, homogenous and centrally administered landscapes of tools and services commonly provided in institutions of higher education proved to be conceptually and technologically incompatible with iCamp's overall intervention perspective. Instead, iCamp fostered the systematic use of loosely-coupled, networked tools and services in the realm of social media and social software (such as Wikis, Weblogs, Webfeeds, etc.) to augment personal and distributed learning environments. The conceptual and technological shift provoked by iCamp challenged institutional representatives, facilitators, and students alike. This paper focuses on the description and interpretation of some key challenges, tensions, and barriers experienced by the research and intervention team in the context of the final field study carried out within the project. The paper finally suggests that the reported challenges and barriers represent re-occurring problems in educational research and argues for the need to develop an adequate conceptual framework for educational intervention that focuses on second-order change.

Keywords: educational intervention, social media, higher education, system change

1. The iCamp project

iCamp was a research and development project that was funded under the IST programme of the European Commission in the 6th Framework Programme. From 2005 to 2008 it designed and carried out a series of targeted interventions into existing teaching and studying practices within clusters of selected European universities. These interventions tried to challenge established routines in teaching and studying in a systematic and structural manner. The main educational objective of the project was the creation of opportunities to advance existing dispositions (knowledge, skills, orientations) for successful action in areas that are characteristic for distributed, mediated work settings. The areas of challenge that were of particular interest in iCamp were described as *self-directing intentional learning projects*, *collaborating with others*, and *social-networking* (Fiedler & Kieslinger 2006; Fiedler et al. 2009). iCamp assumed that domain-specific teaching can be (re-)organised, (re-)structured and (re-)mediated (Engeström 1999) in a way that makes the advancement of dispositions for successful action in the specified areas possible. In addition, iCamp carried out its interventions within specific formal higher-educational settings in which actors were distributed over geographic locations, institutions, disciplines, language communities, and national educational systems. Communication and (inter-)action in these settings were technologically mediated making use of increasingly diverse landscapes of networked tools and services. Our remaining description and analysis in this paper draws on data from the third and final iCamp field study.

1.1 Institutional and curricular context of iCamp's final field study

iCamp's third intervention field study was carried out as an international, distance, postgraduate course titled *elearning* in the spring semester 2008 (March – June). This course was part of the accredited, international Master's program *Interactive Media and Knowledge Environments* (http://imke.tlu.ee/) that is taught in English at Tallinn University (http://www.tlu.ee), Estonia. The course was also offered under the EMIM (European Masters in Interactive Multimedia; http://www.valnet-emim.eu) program. The EMIM consortium consists of six European Higher Learning Institutions (HEIs) that offer postgraduate courses free of charge to students enrolled in one of their partner institutions. For the third iCamp intervention field study, Tallinn University opened up the course *e-learning* (free of charge) to students of iCamp partner institutions and to several 'associated' partner institutions that had been invited to take part in the field study. Altogether 77 students and ten

facilitators from seven different European countries (Estonia, Finland, Spain, Croatia, Bulgaria, Lithuania, and Poland) took part in the study.

1.2 Focus of intervention

The particular focus of intervention in iCamp's third field study was the creation of opportunities for advancing dispositions in the area of self-directing intentional learning projects. Thus, the teaching and studying practices had to be re-organised accordingly. To allow for the expression and actualisation of self-direction in education one generally has to gradually increase the degrees of freedom of all actors involved. This requires a shift of control and a re-distribution of responsibilities in relation to core aspects of formal educational settings such as: setting objectives; selecting and executing appropriate actions and activities; selecting, combining, and integrating resources and technological tools and services; and defining criteria and procedures of evaluation. For a more detailed description of how this shift of control and re-distribution of responsibilities was carried out in the field study, we need to refer the interested reader to the following project reports (Fiedler et al. 2009; Nguyen-Ngoc & Law 2009).

2. Challenges and barriers for educational intervention

In the remaining paper we attempt to extract and present an exemplary summary of concrete challenges, barriers and contradictions that occurred in the context of iCamp's third intervention field study. These will be presented from the perspective of the interventionist/researcher while drawing on observational data elicited from the main groups of actors: institutional representatives, facilitators and students.

The following descriptions were extracted through a qualitative content analysis (Wolcott 1994) of several data sources such as e-mail exchanges, interviews with 9 facilitators, material found in the records of their video-audio meetings, the facilitators' personal Weblog posts, and traces in their Web-based workspace, student interview transcripts, students' personal Weblog posts, and digital traces in various Web-based tools and services they had used during the course. All quotations from the original materials are kept unedited throughout the paper regardless of grammatical mistakes.

2.1 Working with institutional representatives

Since iCamp's intervention studies intentionally crossed institutional boundaries, we had to directly or in-directly work with various institutional representatives who were in charge of study programmes and enrolment, work contracts, time schedules, grading schemes and certificates, and landscapes of tools and services. Working with a whole cluster of institutions and their various representatives regularly produced challenges and contradictions for the intervention team. The following descriptions provide a few prominent examples of what type of problems had to be addressed and resolved to support our educational intervention efforts.

2.1.1 Enrolment and fees

Implementing a cross-institutional educational experience and field study in European higher education immediately triggered issues around enrolment and fees. iCamp anchored its final study at Tallinn University, Estonia. However, usually students who are not enrolled at Tallinn University have to pay a tuition fee for taking courses. Thus an explicit agreement had to be reached between Tallinn University and the educational intervention team to waive the tuition fees for students of participating institutions. Nevertheless, some of the representatives of these institutions initially expected a bi-lateral agreement with Tallinn University. This turned out to be a rather difficult and time-consuming requirement and was only dropped after several rounds of negotiation.

2.1.2 Facilitators' work contracts

In addition to the students' enrolment and fee topic the monetary compensations for facilitators became an issue. Usually institutions that employ facilitators provide their salaries. However, in the field study work contracts had to be signed with all the facilitators to compensate them for the additional workload. The administrative task of issuing valid employment contracts for facilitators from a range of European countries turned out to be a challenging and time-consuming affair for both the facilitators and the intervention team because of the administrative barriers set up by local tax officers and employers.

2.1.3 Compatibility of institutional schedules

Finding a common time frame for all the involved parties was a considerable challenge in a cross-institutional intervention context. All participating institutions had to adjust as much as possible to the semester schedule of Tallinn University and the EMIM consortium (Nguyen-Ngoc & Law 2009). Participating students from Spain, for example, were still busy with their internships in England when the course started in and could only join two weeks later. Furthermore, the intervention team didn't monitor the national holidays of all participating parties and thus faced an unexpected challenge in the middle of the course when an exceptionally long national holiday in one country interrupted the collaborative work activities.

2.1.4 Adjustment of grading schemes and certificates

Some of the participating institutions had to issue credit points by themselves (for example Finland, Croatia) as the *e-learning* course had actually replaced a course within their institutional programme. Other institutions however wanted certificates issued by Tallinn University as they treated the *e-learning* course as an additional offer. At Tallinn University it was initially unclear who had the right to issue certificates in English to foreign students. Only after laborious negotiations the head of the Institute of Informatics (representative of EMIM in Tallinn University) was granted the right to issue the necessary certificates.

2.1.5 Resources and landscapes of tools and services

Often institutions have their own specific requirements that obstruct flexibility in course design, use of open resources and technological infrastructure. According to the EMIM consortium agreement, for example, Moodle had been prescribed as the central platform for all their online courses. Although the iCamp intervention emphasised the participants' free choice of open source, social media tools and services for carrying out their tasks and mediating their activities (Fiedler & Pata, 2009), the educational interventionists were forced to make use of a central Moodle platform for the field study. The intervention team tried to reduce the use of this Moodle platform to a minimum and supported the set up and growth of landscapes of loosely-coupled tools and services instead. This approach created tensions with some representatives of the EMIM consortium whose view can be illustrated by the following email: *"First of all, I do agree that a module that is about E-Learning is supposed to have students use a variety of Virtual Learning environments. However, the Learning Zone at valnet-emim.eu is the agreed platform for the base of all materials for the EMIM modules. When I go to the E-Learning module in the Learning Zone all I get is a general module descriptor, then one News Forum that tells me to go to a blog where all materials will be stored and that Moodle isn't going to be used in the module. I have significant problems with this."* The lack of freedom regarding the use of technological tools and services granted by the EMIM consortium created a considerable initial barrier for implementing some of the core ideas behind the intended intervention. Furthermore, it created confusion among facilitators about the role of landscapes of loosely-coupled tools and services within the overall intervention approach and thus made it considerably harder for the intervention team to support the construction of compatible understandings.

2.2 Shift of control and re-distribution of responsibilities form the perspective of facilitators

Since iCamp's third intervention study focused on shifting control from an educational "authority" to an individual student or a group of students (Williams 1996), it is rather obvious that facilitators played a crucial role for such an endeavour. Their own history and socialisation within a particular educational system however, left them more or less prepared for supporting such a change process. The following interview statement from one of the facilitators illustrates this issue: *"… how to facilitate,… because facilitation is a new term here in Croatia,… so we didn't have a chance to meet with this facilitating purpose and activities. This is something that should be introduced to us: what are the central facilitating activities that should be done? How to overcome the common problems? When should facilitators interact, when is the right time? At which level should the facilitator include himself into the content creation or activities?"* It seems unlikely that facilitators who were searching for such guidance were really in the position to scaffold the intended shift of control and re-distribution of responsibilities within the field study.

2.2.1 Objectives

For a successful intervention into existing teaching and studying practices, it is important to have facilitators on board who understand the objectives and focus of the intervention. To construct a compatible interpretation and understanding the facilitators ideally should be involved in the early planning and preparation stages of an intervention. iCamp only partially succeded in this respect. One of the facilitators shared her observations of some shortcomings within the field study: *"Everybody has a different background, so to find a common ground, it was a nightmare. I would not do this course again in the sense that only some of us design it and then other facilitators were not involved in it from the beginning. I would just take them in the beginning, design it together and we would just get this common understanding and then we would know what we want to do"*. One face-to-face meeting, asynchronous collaboration on a Web-based workspace, and a series of audio-video meetings before and during the intervention still left some facilitators with the impression that there had not been enough time and information exchange to build an adequate level of shared understanding. One of the facilitators said for example in an interview: *"…we must be very well introduced into the course and we must know every corner of the course, every task, because it is crucial if he wants to facilitate as he is supposed to. It was difficult because we didn't have enough information and enough experience"*. Though the failure of integrating all facilitators into the early planning and preparation stages of the field study certainly created unnecessary barriers, it seems questionable that a lack of time and information was the key issue preventing the construction of a compatible understanding of the objectives and focus of the intervention. In fact, there is reason to believe that the ideosynchratic aspects that we mentioned in the paragraph above also influenced the interpretation and perception of the intervention objectives.

2.2.2 Actions and activities

Shifting control to an individual student or a group of students also requires facilitators to change their actions accordingly (Krasworm & Bing 1992; Slusarksi 1994). For example, while presenting and lecturing is getting reduced to a minimum, continuous monitoring of student activities, moderating, and coaching groups and individuals become more important. Involving a number of facilitators in the field study with contrasting background knowledge and experiences inevitably resulted in a variety of perceptions and interpretations of what actions a facilitator could actually carry out in such a setting. One of the facilitators stated her ambivalence in an interview: *"I had my freedom, I could decide what I think is best and what kind of strategies to take. You have a lot of ways to be a facilitator and when you are choosing for one way, or deciding how to be a facilitator, you are not sure if it is the correct way."* The perceived freedom in respect to one's own actions obviously brought along a considerable level of uncertainty, thus increasing the likelihood of falling back on old habits and patterns. The perceived potentials for actions of what a facilitator *can* do in such settings, was complimented by the perceived responsibilities of what facilitators *should* and *have to* do. The analysis of the facilitators' Weblog posts and interviews showed again a considerable variety of how they perceived their responsibilities. One of the facilitators said *"…I still think we have quite different views about how to work with the students and what are the facilitators tasks and roles."* This variability of facilitators' actions and experienced contradictions presented a serious challenge for the intervention team. Engeström (2001), for example, argues that one should try to make the "participants face and articulate the contradictory demands inherent in their work activity" (p. 142). In iCamp we failed to work with these issues systematically already while the intervention study was carried out. In retrospect it seems that too much effort was spent on supporting the actual work with the students and too little attention was paid to the systemic contradictions that most facilitators experienced.

2.2.3 Resources and landscapes of tools and services

As already mentioned earlier, the overall iCamp intervention approach stressed the importance and necessity of using distributed landscapes of tools and services instead of one centralised and closed system (Fiedler & Kieslinger 2006). However, the analysis of the third field study showed that the facilitators' experiences of acting in landscapes of loosely-coupled, networked tools and services were rather limited, thus making it difficult to model and scaffold successful practices for individual students and student groups. Instead, some facilitators even made several attempts to restrict all mediated teaching and studying actions to the central Moodle platform that had been favoured by some institutional representatives. iCamp had obvioulsy attracted some facilitators who were drawn by their general interest in "novel" technologies in education on one side, but lacked the personal history and experience with using these networked tools and services in distributed settings.

2.2.4 Criteria and procedures of evaluation

A shift of control and re-distribution of responsibilities calls for a change in evaluation procedures, too. In iCamp's final intervention field study we considered self- and peer-evaluation as equally important as the evaluation given by the facilitators (Fiedler et al. 2009). This view was met with resistance and scepticism and triggered various rounds of discussion and negotiation among the facilitators. In fact, evaluation procedures had proven to be a crucial area of tension and systemic contradiction in the two prior field studies carried out in iCamp. Based on this experience we started a series of synchronous and asynchronous exchanges in an early stage of the final field study. However, even after an agreement had been seemingly achieved most facilitators finally "failed" to support peer-assessment procedures on time, thus rendering this evaluation source obsolete.

2.3 Shift of control and re-distribution of responsibilities from the perspective of students

In the intervention study it was quite apparent that different educational systems had an influence on students' readiness to deal with a considerable shift of control and responsibility for one's own learning projects individually and in groups (Kasworm & Bing 1992). One of the facilitators reported the following experience: *"For me, differences between countries are not so obvious as the difference between educational systems. They had problems with taking responsibility for themselves."* One student claimed, for example, that: *„This e-learning course was something new to me. Because when I finished university I was trained in a totally different system. It was a system where you had to do your homework and that's all. It wasn't something interactive, you know."* The shift of control also comprised selecting and defining the objectives for one's learning project, the adequate actions and activities, resources and tools, and criteria and procedures of evaluation to map one's success.

2.3.1 Objectives

In formal higher education the usual practice emphasises a facilitator as the responsible person for setting up objectives and defining strategies for fulfilling them. Thus, having suddenly the freedom to set up objectives for one's own learning project within a larger, loosely structured course framework can be quite challenging (Candy 1991). One of the students claimed: *„at some point I wrote an e-mail to our facilitator and said that I don't really know what to do here? What's my role in here? What's my place?... because I don't know how to start this…".* Planning one's objectives, monitoring their realisation, and reflecting upon one's progress, were crucial tasks for students throughout the field study. Participants who did well on these tasks in the early stages of the course were likely to take control of their own actions and activities in later stages, while the others kept questioning why they should explicate their own objectives in the first place. This general pattern commonly triggers questions about the viability and degree of "success" of the type of educational intervention that iCamp tried to carry out. After all one can always observe students struggling with (and sometimes failing to adapt to) the new configuration of responsibility and control. This produced regular tensions among various members of the intervention team and some facilitators, who did not share the same view on the necessity and importance of perturbation for the acquisition of new dispositions (like attitudes and orientations) for self-directing intentional learning projects.

2.3.2 Actions and activities

Shifting control from facilitators to individual students or a group of students requires also different sets of actions and activities to be carried out by students. In our field study however, many students didn't perceive the actual freedom and flexibility the intervention emphasised. One student claimed: *„I don't think that you gave a lot of freedom as there was some materials you had to read, so I didn't have any choice there and then there was this reflection I had to do…so I actually didn't have enough freedom to choose how I want to learn and what will I want to do."* The students also had different opinions about who should actually be responsible for assigning tasks. One student said: *„in my opinion the facilitator should assign different tasks among the group members. I think that somebody has to lead the group and this is the task of the facilitator and if there is a problem then it is the job of the facilitator to solve it."* The wide range of interpretations and divergent perceptions of what students and facilitators can and should do was also expressed by one facilitator: *"There was some cultural problems between different people form different nationalities in understanding their roles and their way they have to perform their joint project. Also the approach for treated agendas, data, timelines, and deadlines. It is not common in some cultures, some countries. Students from Eastern countries were sure that the only main thing is to give final product. Then they sacrificed much time to create*

the course and they ceased reflecting, they ceased working on their contracts and so on". These various attempts to conserve well-known action patterns and habits pose a considerable challenge for every educational intervention that tries to re-configure the general distribution of control and responsibility in formal education. Nevertheless, we firmly believe that this should not be treated as a weakness, anomaly, or a firm sign of failure. On the contrary, from a diagnostic perspective these observed contradictions might orientate the interventionist's search for "significant levers for change" (Foster-Fishman, Nowell & Yang 2007) or indicate normative elements (beliefs, orientations, attitudes, etc.) that are incompatible with the overall change effort and thus need to be addressed to prevent complete failure.

2.3.3 Resources and landscape of tools and services

Shifting control should also provide students with opportunities to assemble and maintain their own landscape of tools and services according to their objectives and needs (Väljataga & Fiedler 2008). So far technologically mediated educational experiences are mainly carried out behind closed "doors" and therefore students generally lack experience with using only loosely-coupled, networked tools and services to support their own activities and purposes. iCamp's third intervention study emphasised openness, accessibility, and transparency in regard to resources and a range of mediated activities carried out by the participants (Fiedler & Kieslinger 2006). An analysis of the available data sources showed that tools and services that offered publicly accessible traces of their use (such as wikis, weblogs, etc.) evoked concerns and resistance in some cases. One student claimed *"…I was very afraid of using a tool that was public because I found I cannot do it well. It was a strong barrier"* while another one proposed: *„…Google Group - I think it's a very good tool because you have a closed community, you need an invitation to get in. Its not like someone can find it by accident".* Furthermore, some students questioned the general validity of taking responsibility for their own landscapes of tools and services. One student explained: *„I am not the huge fan of distributed learning environment. It is hard to manage it in that way and it is hard to create some structure and some logical system. When you have all the knowledge in one place it is easier to manage and I think that technology should help learning and not distract it".* Another student also complained: *„…I wasn't very comfortable with them. It wasn't very specific, what tools do we need to complete our tasks."* These examples show that some students' perception and interpretation of this aspect of the intervention were not well aligned with the interventionists' purposes. Our failure to create compatible understandings among students and facilitators in regard to the potential benefits of breaking away from closed, centralised systems for mediating distributed collaboration, clearly limited the potential impact of our intervention efforts in this area.

2.3.4 Criteria and procedures of evaluation

In iCamp's third intervention study we introduced *personal learning contracts* (Harri-Augstein & Webb 1995) as an instrument for supporting the students to evaluate their progress and success according to their own objectives and evaluation criteria. Even so we had tried to embed this instrument in a conversational framework and "coaching" approach (Harri-Augstein & Thomas 1991) many students' perception of the learning contract remained incompatible with the interventionists' intentions. One student claimed, for example: *„I really don't see how it is helpful. It's not really helpful for us as it is for the people tracking the course. With that they can see what each of us is doing and it presents a certain task within the course, a task which can be graded later."* This presents a good example of how some students perceived and framed the conversational learning contract procedure. Also facilitators experienced that: *„Some students didn't quite understand the goals and the role of this (learning contract) concept. It was difficult to explain to the students how they can use this instrument, because this is possible, or valuable instrument for those who are really self-directed learners".* It appears that facilitators largely failed to embrace and implement a conversational "coaching" approach and thus left some students' incompatible perceptions and their inadequate application of the instrument largely unchallenged.

3. Concluding remarks

We would like to suggest that our summary of exemplary challenges and barriers illustrates a number of re-occurring problems and obstacles that tend to emerge regularly if one tries to intervene into current teaching and studying practices in formal higher education. Especially interventions that try to bring about "radical innovation" hardly ever seem to produce lasting changes in the field. There are various reasons why this is the case. First of all, initial implementations of an intervention approach are usually not immediately successful and the allocated time frames mostly don't allow for sustained

development and elaboration (Bereiter 2002). Secondly, many actors within formal educational systems tend to "assimilate" new practices and technologies during their early stages of dissemination and adoption, when they attempt to replicate existing practices and trusted patterns of action.

The challenges and barriers that we described in this paper demonstrate that interventions into systems of organised complexity (such as living systems and their aggregates) simply cannot (and should not) be modelled with clear cause-and-effect relationships. Any intervening entity is only the "author" of impulses or triggers for change, but it is the system itself that "reads" and processes the impulses, following its own criteria and mode of operation (Willke 2005). We believe our examples from working with different groups of actors illustrate this phenomenon quite well. Since the inner operation of a complex system is intransparent for an observer (and interventionist), the occurrence of differing interpretations and perceptions among various actors is thus rather the norm than the exception. Thus, it appears that we need to focus more on the interplay between mutual observations and expectations of all actors. We need to monitor, interpret, and negotiate each other's actions and underlying objectives, to improvise accordingly.

With a few exceptions (for example Bathany 1991, 1992; Harri-Augstein & Thomas 1991; Engeström 1999, 2001) it is not too easy to find explicit attempts of reflecting and theorising about "intervention" and "system change" within contemporary educational research. This is somewhat surprising since other areas of "human intervention" like organisational change, therapy, coaching, and community psychology, at least partially embraced system thinking and produced a variety of theoretical frameworks, reflections, and methodological suggestions (see for example Midgely 2000; Foster-Fishman, Nowell, & Yang 2007; Agyris 1970; Churchman 1997; Hawe, Shiell & Riley 2007; Parsons 2007; Flyvbjerg, 2001). We believe that a careful examination of these proposals could offer inspiration for the development of a more elaborate conceptual framework and methodology for educational interventions of the kind that we carried out in iCamp. Such an effort should be paired with an analysis and documentation of concrete problems, contradictions and challenges that are regularly encountered while intervening in higher educational settings. Too often we only get the polished reports of yet another "success story" of how educational practices were improved by implementing new technological instruments, without any indication of what contradictions and tensions this instrumental re-mediation (Engeström 2001) actually produced.

Much of educational research and development seems to still target first-order change, focusing on incremental improvements and changes within existing modes of practice. In this context, simple cause-and-effect models and the accompanying methods of intervention and evaluation can somewhat work. Second-order change on the other hand (Foster-Fishman, Nowell & Yang 2007) that intends to fundamentally alter how things are done within a specific human activity system, requires a different conceptual and methodological approach. We think that the practices that are emerging around networked tools and services can actually play an important role in this necessary re-conceptualisation and re-mediation of intervention into higher education. These emerging opportunities, however, need to be embedded into a conceptual framework that possibly integrates concepts from system thinking, system change, and human activity theory.

Acknowledgments

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